Amendments of the Claims:

A detailed listing of all claims in the application is presented below. This listing of claims will replace all prior versions, and listings, of claims in the application. All claims being currently amended are submitted with markings to indicate the changes that have been made relative to immediate prior version of the claims. The changes in any amended claim are being shown by strikethrough (for deleted matter) or underlined (for added matter).

1-23. Cancelled

24. (Previously presented) A processing module for generating an image using an algorithm for determining the level of energy emanating from a source located with in a mass, by executing a plurality of expressions, where data is collected by a plurality of sensors, the processing module comprising:

a bulk memory bank for receiving and storing data; and

a parallel execution module having a plurality of functional execution units coupled together, each functional execution unit performing a predetermined expression from the algorithm, and in electrical communication with a data flow unit, the data flow unit (DFU) coupled to the bulk memory bank and the parallel execution module, wherein the data flow unit retrieves and supplies data to the functional execution units on each clock cycle, wherein the functional execution units receive data from the data flow unit and return data results at least once every clock cycle.

25. (Previously presented) The processing module of claim 24, wherein the plurality of functional execution units are utilized concurrently during the clock cycle.

26. (Previously presented) The processing module of claim 24, wherein the plurality of execution units are arranged into one or more pipelines and are arranged to receive data from the memory into the one or more pipelines and all expressions forming the algorithm are executed on a single clock cycle when the pipeline is fully loaded with data.

27. (Previously presented) The processing module of claim 24, wherein the functional execution units are implemented in application-specific integrated circuits (ASICs), gate arrays, or field programmable gate arrays (FPGAs).

28. (Previously presented) The processing module of claim 24, wherein the parallel execution module further comprises:

a travel time processor, the travel time processor having a plurality of execution units arranged to calculate the travel time for the energy between the source in the mass and the sensor; and

a trace processor, in electrical communication with the travel time processor, the trace processor having a plurality of execution units arranged to determine the level of energy emanating from at least one source and recorded by at least one sensor.

29. (Previously presented) The processing module of claim 28, wherein the travel time includes the combined travel time of energy from a shot position to the source and from the source to a sensor.

30. (Previously presented) The processing module of claim 28, wherein the travel time includes only the travel time of energy from the source to the sensor.

31. (Previously presented) The processing module of claim 28, wherein the travel time processor includes an interpolator formed from a plurality of execution units arranged to process first and second travel times corresponding to first and second sources, respectively, and interpolate an intermediate travel time from a third source positioned intermediate to the first and second sources.

32. (Previously presented) The processing module of claim 28, wherein the travel time processor includes cache, memory, and an interpolator, the memory configured to store a plurality of predetermined travel times forming a coarse grid of travel times, the plurality of travel times including a first, second, third, and fourth travel times corresponding to first,

second, third, fourth sources, respectively, the interpolator being formed from a plurality of execution units arranged to:

receive the first and second predetermined travel times from memory, interpolate a first intermediate travel time for a first intermediate source positioned between the first and second sources, and cache the first intermediate travel time;

receive the third and fourth predetermined travel times from memory, interpolate a second intermediate travel time for a second intermediate source positioned between the third and fourth sources, and cache the second intermediate travel time; and

receive the first and second intermediate travel times from cache, interpolate a third intermediate travel time for a third intermediate source positioned between the first and second intermediate sources.

33. (Previously presented) The processing module of claim 28, wherein the parallel execution module is further configured to generate an image from the level of energy emanating from each source and recorded at the sensor.

34. (Previously presented) A processing module (200) for generating an image using an algorithm for determining the level of energy emanating from a source located with in a mass, by executing a plurality of expressions, where data is collected by a plurality of sensors, the processing module comprising:

a bulk memory bank (204) for receiving and storing data;

a parallel execution module (202) having a plurality of functional execution units (206) coupled together, each functional execution unit (206) performing a predetermined expression from the algorithm, and in electrical communication with a data flow unit (208), the data flow unit (DFU) (208) coupled to the bulk memory bank (204) and the parallel execution module (202), wherein the data flow unit (208) retrieves and supplies data to the functional execution units (206) on each clock cycle, wherein the functional execution units (206) receive data

from the data flow unit (208) and return data results at least once every clock cycle; and

wherein the plurality of execution units are arranged into one or more pipelines and are arranged to receive data from the memory into the one or more pipelines and all expressions forming the algorithm are executed on a single clock cycle when the pipeline is fully loaded with data.

35. (Previously presented) A method of implementing an algorithm in a processing module characterized by the steps in combination of:

a) determining responsibilities of a plurality of host computers;

b) programming the plurality of host computers to provide raw data to processing modules;

c) determining the memory needed to store processing execution results from the processing modules;

d) deriving hardware implementations for the algorithm and for each expression in the algorithm;

e) creating a gate-level netlist, the netlist corresponding to the expressions for determining the energy level emanating from each source and recorded at each sensor; and

f) placing and routing the netlist to circuitry.

36. (Previously presented) The method of claim 35, wherein placing and routing the netlist in circuitry further includes placing and routing the netlist in reconfigurable circuitry.

37. (Previously presented) The method of claim 35, wherein placing and routing the netlist in circuitry further includes placing and routing the netlist in hardwired circuitry.

38. (Previously presented) The method of claim 35, wherein placing and routing the netlist in circuitry further includes placing and routing the netlist in silicon material.

39. (Previously presented) An apparatus for interpolating travel times for energy between a source in a mass and a sensor, the apparatus comprising:

cache;

memory configured to store a plurality of travel times forming a coarse grid of travel times, the plurality of travel times including first, second, third, and fourth travel times corresponding to first, second, third, and fourth sources, respectively; and

an interpolator formed from a plurality of execution units arranged to receive the first and second predetermined travel times from memory, interpolate a first intermediate travel time for a first intermediate source positioned between the first and second sources, and cache the first intermediate travel time; receive the third and fourth predetermined travel times from memory, interpolate a second intermediate travel time for a second intermediate source positioned between the third and fourth sources, and cache the second intermediate travel time; and receive the first and second intermediate travel times from cache, interpolate a third intermediate travel time for a third intermediate source positioned between the first and second intermediate sources.

40. (Previously presented) A method of generating an image using an algorithm for determining the level of energy emanating from a source located in a mass using a processing module comprising a bulk memory bank, a parallel execution module, and a data flow unit, characterized by the steps in combination of:

a) providing data from a plurality of sensors of the source located in the mass;

b) sending the data from the plurality of sensors to the bulk memory for storing the data;

c) providing the data stored in the bulk memory to the data flow unit;

d) sending the data received by the data flow unit to the parallel execution module having a plurality of functional execution units coupled together, each functional execution unit performing a predetermined expression from the algorithm each

clock cycle when a pipeline of the functional execution units is fully loaded with data; and

e) outputting the results of the functional execution units to the data flow unit.